INTERNATIONAL STANDARD

ISO/IEC 13719-1

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Information technology — Portable Common Tool Environment (PCTE) —

Part 1:
Abstract specification

Technologies de l'information — Environnement d'outil courant portable (PCTE) —

Partie 1: Spécifications abstraites

Reference number
ISO/IEC 13719-1:1998(E)

Contents

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 13719-1 was prepared by ECMA (as Standard ECMA-149) and was adopted, under a special "fast-track procedure", by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

This second edition cancels and replaces the first edition (ISO/IEC 13719-1:1995), which has been technically revised.

ISO/IEC 13719 consists of the following parts, under the general title *Information technology - Portable Common Tool Environment (PCTE):*

– *Part 1: Abstract specification*

– *Part 2: C programming language binding*

– *Part 3: Ada programming language binding*

– *Part 4: IDL binding (Interface Definition Language)*

Annexes A to D and annexes F and G form an integral part of this part of ISO/IEC 13719. Annex E is for information only.

Information technology — Portable Common Tool Environment (PCTE) —

Part 1:
Abstract specification

1 Scope

This part of ISO/IEC 13719 specifies PCTE in abstract, programming-language-independent, terms. It specifies the interface supported by any conforming implementation as a set of abstract operation specifications, together with the types of their parameters and results. It is supported by a number of standard *bindings*, i.e. representations of the interface in standard programming languages.

The scope of this part of ISO/IEC 13719 is restricted to a single PCTE installation. It does not specify the means of communication between PCTE installations, nor between a PCTE installation and another system.

A number of features are not completely defined in this part of ISO/IEC 13719, some freedom being allowed to the implementor. Some of these are *implementation limits*, for which constraints are defined (see clause 24). The other implementation-dependent and implementation-defined features are specified in the appropriate places in this Standard.

PCTE is an interface to a set of facilities that forms the basis for constructing environments supporting systems engineering projects. These facilities are designed particularly to provide an infrastructure for programs which may be part of such environments. Such programs, which are used as aids to systems development, are often referred to as tools.

This part of ISO/IEC 13719 also includes (in annex B) a language standard for the PCTE Data Description Language (DDL), suitable for writing PCTE schema definition sets.

2 Conformance

2.1 Conformance of binding

A binding conforms to this part of ISO/IEC 13719 if and only if:

- it consists of a set of operational interfaces and datatypes, with a mapping from the operations and datatypes of this part of ISO/IEC 13719;
- each operation of this part of ISO/IEC 13719 is mapped to one or more sequences of one or more operations of the binding (distinct operations need not be mapped to distinct sets of sequences of binding operations);
- each datatype of this part of ISO/IEC 13719 is mapped to one or more datatypes of the binding;
- each named error of this part of ISO/IEC 13719 is mapped to one or more error values (status values, exceptions, or the like) of the binding;
- the conditions of clause 23 on common binding features are satisfied;

- the conditions for conformance of an implementation to the binding are defined, are achievable, and are not in conflict with the conditions in 2.2 below.

2.2 Conformance of implementation

The functionality of PCTE is divided into the following modules:

- The core module consists of the datatypes and operations defined in clauses 8 to 19 (except 13.1.6, 13.4, and 13.5) and 23.
- The mandatory access control module consists of the datatypes and operations defined in clause 20.
- The auditing module consists of the datatypes and operations defined in clause 21.
- The accounting module consists of the datatypes and operations defined in clause 22.
- The profiling module consists of the datatypes defined in 13.1.6 and the operations defined in 13.4.
- The monitoring module consists of the datatype Address defined in 13.1.6 and operations defined in 13.5.
- The fine-grain objects module consists of the following extensions defined in annex F:
  - . extensions to the semantics of operations to cater for fine-grain objects;
  - . new operations;
  - . new error conditions;
  - . additions to the predefined SDS system.
- The object-orientation module consists of the following extensions defined in annex G:
  - . additions to the predefined SDSs metasds and system;
  - . an extension to the semantics of the operation SDS_REMOVE_TYPE to cater for the new classes of type;
  - . new operations;
  - . new error conditions.

An implementation of PCTE conforms to this part of ISO/IEC 13719 if and only if it implements the core module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with mandatory access control level 1 or 2 if it implements the core module and in addition:

- for level 1: the mandatory access control module except the floating security levels features defined in 20.1.6;
- for level 2: the mandatory access control module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with auditing if and only if it implements the core module and in addition the auditing module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with accounting if and only if it implements the core module and in addition the accounting module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with profiling if and only if it implements the core module and in addition the profiling module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with monitoring if and only if it implements the core module and in addition the monitoring module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with fine-grain objects if and only if it implements the core module and in addition, implements the fine-grain objects module.

An implementation of PCTE conforms to this part of ISO/IEC 13719 with object-orientation if and only if it implements the core module and in addition the object-orientation module.

By 'an implementation implements a module' is meant that, for the clauses of the module:

- the implementation conforms to a binding of this part of ISO/IEC 13719 which itself conforms to this part of ISO/IEC 13719 and which is itself an International Standard;
- if an operation of this part of ISO/IEC 13719 is mapped to a set of sequences of operations in the binding:
  - . case 1: operation_A; operation_B; ... operation_F;
  - . case 2: operation_G; operation_H; ...operation_M;
  - . etc.

  then in each case the sequence of invocations of the operations of the implementation must have the effect of the original operation of this part of ISO/IEC 13719;
- the relevant limits on quantities specified in clause 24 are no more restrictive than the values specified there;
- the implementations of the implementation-defined features in this part of ISO/IEC 13719 are all defined.

An implementation of PCTE does not conform to this part of ISO/IEC 13719 if it implements any of the following, whether or not the PCTE entity mentioned is in a module which the implementation implements:

- an operation with same name as a PCTE operation but with different effect;
- an SDS with the same name as a PCTE predefined SDS but with different contents;
- an error condition with the same name as a PCTE error condition but with different meaning.

2.3 Conformance of DDL texts and processors

A DDL definition conforms to this part of ISO/IEC 13719 if it conforms to the syntax and obeys the constraints of the DDL definition in annex B.

A DDL processor conforms to this part of ISO/IEC 13719 if it accepts any conforming DDL definition and processes it in conformance with the meaning of DDL as defined in annex B.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 13719. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 13719 are encouraged to investigate the possibility of applying the most recent editions

of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 2022:1994,	*Information technology - Character code structure and extension techniques.*
ISO 8601:1988,	*Data elements and interchange formats - Information interchange - Representation of dates and times.*
ISO/IEC 8859-1:1998,	*Information technology - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1.*
ISO/IEC 10646-1:1993,	*Information technology - Universal Multiple-Octet Coded Character Set (UCS) - Part 1: Architecture and Basic Multilingual Plane.*
ISO/IEC 11404:1996,	*Information technology - Programming languages, their environments and system software interfaces - Language-independent datatypes.*
ISO/IEC 13817-1:1996,	*Information technology - Programming languages, their environments and system software interfaces - Vienna Development Method - Specification Language - Part 1: Basic language.*
ISO/IEC 14977:1996,	*Information technology - Syntactic metalanguage - Extended BNF.*